# MICHIGAN DEPARTMENT OF NATURAL RESOURCES

## INTEROFFICE COMMUNICATION



May 3, 1988



TO: John Alford, Roscommon District Office
DNR, Environmental Response Division

FROM: Jean Talanda, Geologist
Hydrogeological Section
Environmental Response Division

SUBJECT: Iron Skillet Restaurant, Lincoln, Work Plan
Lincoln, Village Hardware, Inc. Work Plan
Oscoda Co.

Attached are work plans for the two sites stated above.

If you have any questions, please call me.

Jean Talanda

Attachments

# WORK PLAN

Date: April 5, 1988
By: Jean Talanda

Site: Lincoln Village Hardware, Inc.
Project #: 3414-02310
County: Alcona
Township: Gustin
Section: 1
Town/Range: 26N-8E



**PROBLEM STATEMENT**

Beginning January 1985, one residential well at the Lincoln Hardware was contaminated with Benzene, Ethylbenzene, Toluene, Xylenes and, Ethylene Dibromide. The well was replaced under Act 307 in June of 1986. Because the source and extent of the organics is not apparent, additional private wells may be at risk.

**PREVIOUS SITE WORK:** None.

**GEOGRAPHY**

Lincoln hardware is located at the intersection of Barlow Road and Traverse Bay State Road in the Village of Lincoln (Map-1). The East Branch Pine River, 3/8 mile southeast of the site, flows southward. Approximately 3/8 mile north of the site is Brownlee Lake and 1/2 mile east of the site is Lincoln Lake (map 2). The lakes appear to be hydraulically connected, being part of a string of lakes that decrease in elevation to the southwest. The hardware store lies on a local topographic high which separates Brownlee from Lincoln Lake.

**GEOLOGY**

Lincoln rests on the glacial sands, gravels, and clays of a north-trending moraine. The bedrock, Mississippian Coldwater Shale is 400 to 450 feet BGL. The lithology below the site is a fine loamy sand from the surface to as much as 32 feet BGL. A clean, fine to medium sand (probably eolian) extends from 32 to at least 88 feet BGL. A substantially confining clay layer exists below the sand and separates the upper unconfined aquifer from a lower confined aquifer of undetermined thickness. The clay layer reportedly varies in thickness from 7 to 92 feet within the Village of Lincoln.

Although Lake Huron is only six miles to the east of Lincoln, groundwater is flowing to the southwest toward the East Branch Pine River, eventually draining into Lake Huron. The contaminated aquifer is unconfined, ranging in thickness from 1 to 36 feet. Static water level is 55 feet at Lincoln Hardware but decreases (as does the topography) to the southwest.

**PURPOSE OF STUDY**

Identify PRP's and outline the extent of the VOC contamination.

**WORK PLAN**

By reviewing monitor well logs within the area, most of the domestic wells were found to have been completed in the upper, unconfined aquifer. This aquifer is not protected by an impervious layer from surface contamination. This investigation is divided into 5 phases, designed to determine the hydrogeological conditions that prevail at the site.

**PHASE 1:** The first phase involves assistance from the Roscommon District staff. They will obtain site access, call Miss Dig, and schedule surveyors to set up temporary bench marks and monitor well locations.

**PHASE 2:** The second phase involves the placement of monitor wells within the perimeter of Lincoln to delineate the soil and hydrogeologic conditions.

Monitor well installation: three wells will be installed to determine the groundwater flow direction more precisely. Each monitor well will be drilled to the depth of the water table. If necessary, the wells will be geophysically logged to identify aquifer and lithologic characteristics. A two-inch diameter galvanized steel casing screened with stainless steel will be installed. Water samples will be taken at the water table and tested using field instruments with head space chromatography. Casing and drilling equipment will be streamed cleaned before drilling each well to prevent cross-contamination. Four-inch red locking protective casings will be installed as security. A cement pad will placed around each well at the surface; and, several large red posts will surround each well to make them visible.

After the well installation, the Roscommon District staff will be needed to measure static water levels and sample the wells to test for contamination.

**PHASE 3:** Based the groundwater flow direction determined from the information in Phase 2, additional monitor wells will be installed to track the plume of contaminants. As many as ten monitor wells will be drilled in the same manner as those in Phase 2. They will provide the glacial stratigraphy as well as a means for monitoring groundwater quality at the site. Water samples will be taken from the aquifer and tested using field instruments for specific conductance and head space chromatography. If necessary, the wells may be geophysically logged for better understanding of the aquifer's hydraulic characteristics.

With temporary bench marks and station locations along the roadways, monitor wells can be located and surveyed in as they are installed. Throughout the study, static water levels will be taken from the installed monitor wells thereby allowing us to make decisions on where additional wells are to be placed.

**PHASE 4:** Assistance from the Roscommon District staff will be needed to sample the monitor wells and collect static water levels.

**PHASE 5:** This final phase involves the drafting and publishing of the report.

**PERSONNEL NEEDS**

Phase 1 will require the assistance of the Roscommon District staff.

Phase 2 will involve one driller, two geologic technicians, and one geologist for three days each. The Roscommon District staff will be necessary to collect water quality samples. Samples results may take 1 month.

Phase 3 will require one geologist, one driller, and two geological technicians during the drilling operations (two weeks). Roger Noyce and one technician may be needed after the wells have been installed (one week).

Phase 4 will be handled by the Roscommon District staff.

Phase 5 will require the following: one geologist to develop a report on the site; one technician to create computer-aided maps (one week of work); and secretarial support for the report's final printing. The time frame is approximately 2 months including the time necessary to receive sample results.

## LINCOLN HARDWARE COST ANALYSIS

Following is the cost analysis proposed by the Hydrogeological Section for the Lincoln Hardware project. It addresses only the Hydrogeological Section staff time and drilling expenses.

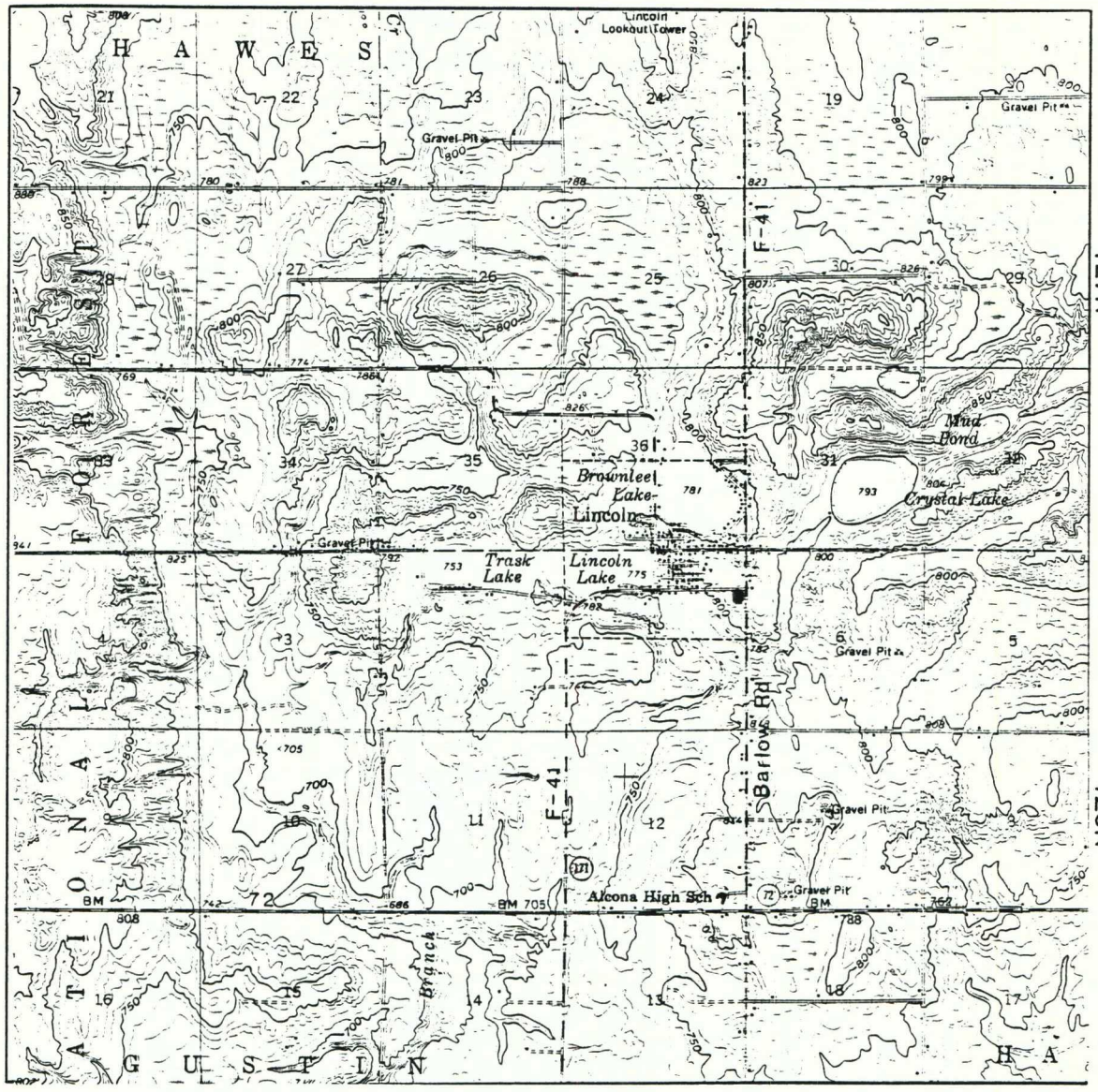
Phase 1 has been completed and Phase 2 is near completion.

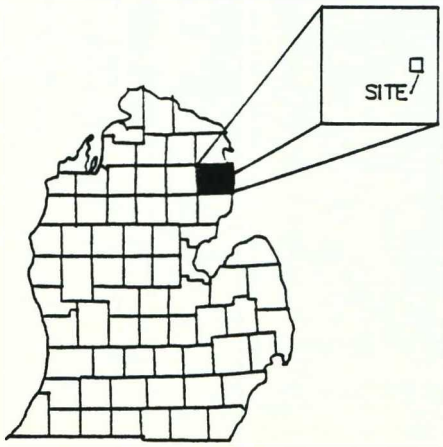
| | | |
|---|---|---|
| Hydrogeological Section Staff Expenses | | $21,582.43 |
| Drilling Expenses (13 wells to 60 feet) | | $ 8,034.00 |
| | Total = | $29,616.43 |

* This work plan includes work to be done by district staff. These costs do not reflect district time and expenses. These costs do not reflect laboratory sample fees.

# *Lincoln Village Hardware, Inc.*

## *Alcona County, Michigan*




## SITE LOCATION MAP

SCALE = MILES

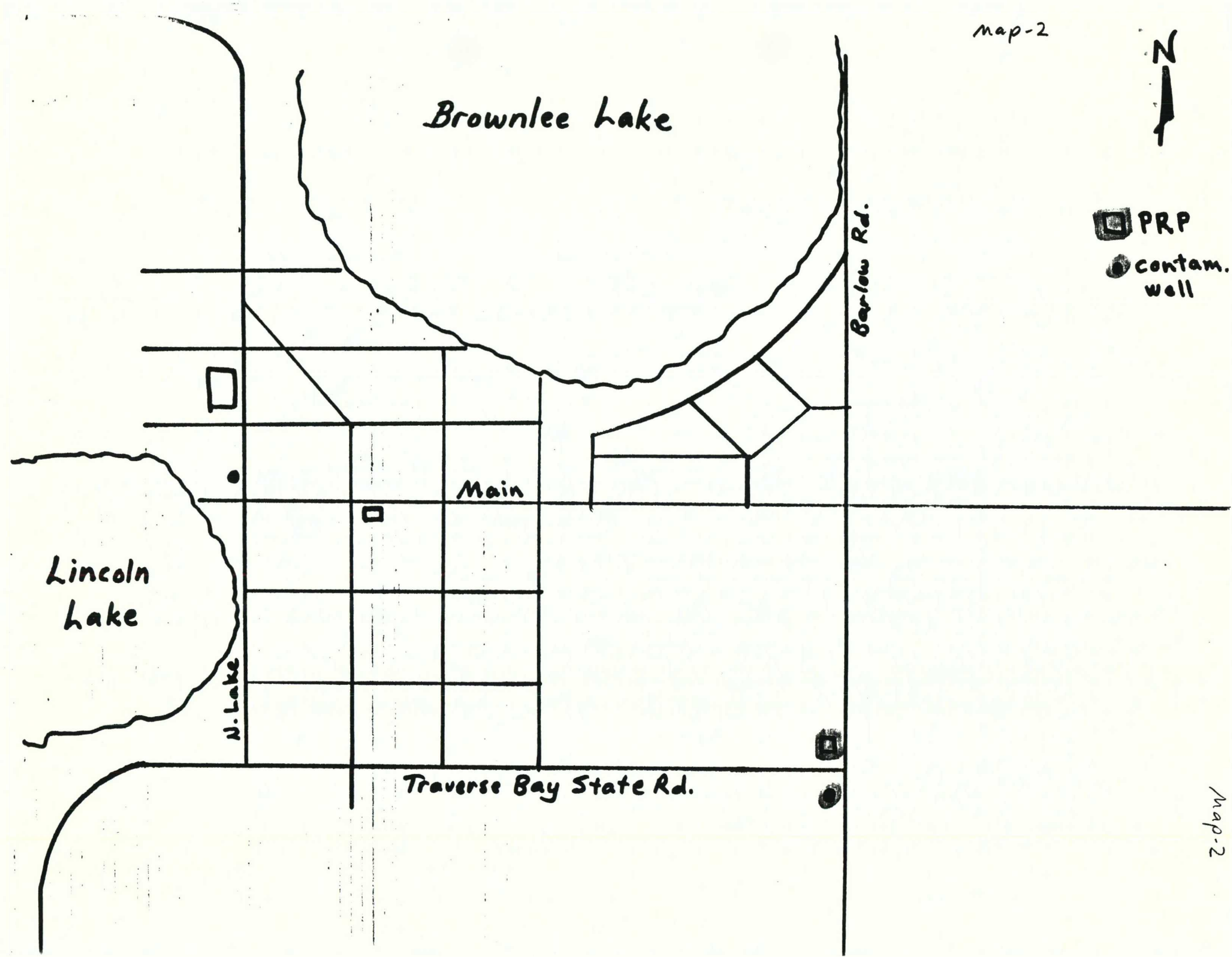
1 .75 .5 .25 0 1 2

CONTOUR INTERVAL 10 FEET

DATUM IS MEAN SEA LEVEL

MAPPED BY U.S.G.S.

FIGURE 1


map-2
N
Brownlee Lake
PRP
contam. well
Barlow Rd.
Main
Lincoln Lake
N. Lake
Traverse Bay State Rd.
map-2